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Speculations on Time

By AVRO MANHATTAN

THE monstrous immensities of a star-atom studded space spiralling in the universe began first to palpitate in the bosom of that mightiest of all monsters: Time. Time remains the most unfathomable of all riddles to that flimsy assembly of molecules aglow with self-consciousness—namely, man. Yet, since his elevation from the brute, *Homo sapiens*, while looking starry-eyed upon himself as the key to all things, has inferred that the cosmo was modelled upon himself, the sole receptacle of comprehension. Such mountainous egotism, he still believes, is sustained by solid facts. As these are reality, and reality is truth, he firmly accepts his conclusions as correct. But what we take as facts often can be no more reality than the reality fabricated by our physical limitations in relation to that outside our sensory perceptions. One of these concerns that most elusive of mysteries: Time.

The reality outside us as a rule escapes us, except when evidenced by phenomena of which we are cognizant, we being inclined to accept as reality only whatever strikes our senses. But that such reality very often *per se* is an illusion is proved by numberless instances. For example, a certain sequence of vibrations is a musical sound. This is made up of a certain number of beats in a second. Were we to hear each vibration separately, however, we would no longer hear them as a musical sound at all. To our ears the vibrations are transformed into a musical sound only if they recur at intervals of not more than the sixteenth part of a second. When they fall below that number, we no longer appreciate them as a musical note but hear them as separate beats. When firing a pistol, for instance, we hear only

pistol shots; but let us increase their frequency to sixteen per second and the same separate pistol shots, by giving us the impression of continuity, will be heard by us as the lowest pipe-note of an organ. Light is composed of rills; but the rills are not light. They become light only when they strike with enormous frequency on the organ of sight.

When a certain number of separate vibrations and rills are no longer observed as separate vibrations or rills by our sensory apparatus, we perceive them as sound and light. The same would happen with time were we to separate it into billions of distinct time units, which is precisely what we do. As each separate vibration or rill, when in motion, seems to flow, so does each distinct time unit: hence what we call "flowing time." Yet, while perceiving flowing vibrations as sound, these remain an unchanged succession of distinct vibrations. We hear them as a flow—namely, as sound—because of our inability to hear each vibration separately. Similarly with light and hence with time, which in reality remains a succession of separate time units, no matter how incredibly short.

But, as each vibration or rill is neither sound nor light, so a time unit does not make time. What to us has transformed the succession of time units into time has been their flow—namely, motion. It is motion that gives us the impression that the vibrations are sound, the rills are light, and the time units are time. Without motion, for us there would be neither sound, light, nor time. Motion, therefore (to us), is the originator of sound, light, and time. Motion is impossible without space, space without time. There cannot be space where there is no time, or time where there

is no space. But equally there cannot be time where there is neither motion nor space. Time, consequently, exists in space. It is space. While space exists in time. Indeed, it is time. Wherever, therefore, there is space, there is time. Wherever there is time, there is space.

Now, if time means space, and vice versa, we cannot treat them as separate units. If space is a reality, then time also is a reality, partaking of the nature of space. If, to traverse space, we have to move, we have to move also to traverse time. Space exists "everywhere" simultaneously and independently of our moving. Any place exists before we get there. Equally time is "everywhere" simultaneously, and the time unit towards which we are moving—namely, the future—exists before we get there—that is to say, before it becomes the present.

If we accept that space is the equivalent of time, and time of space, then we cannot logically say that the place towards which we are travelling is there in space although we have not yet reached it, and yet a day towards which we are travelling is not there because it has not yet become the present. If we insist that, in traversing time, the future is non-existent until we get there—namely, until it has become the present—then we should equally say that, in traversing space, our destination, say New York, does not exist until we get there.

The present is not the future which has reached us, nor is the past the present which has gone. The present in time is the equivalent of the place where we stand now in space. That is to say, as space is simultaneously "everywhere," so the present equally is simultaneously everywhere. London and New York exist independently of us. Because we left London and got to New York, or vice versa, it does not mean that either London or New York exists no longer. Similarly, it does not mean that because yesterday is past it does not exist in time, or that because we have not yet reached tomorrow, tomorrow is non-existent. Yesterday is there, precisely as London, which we left, is still there; while tomorrow is there, as New York, which we have not yet reached, is there. In short, the present is present everywhere in time, as space is space everywhere in space. As the two are one, this means that the present exists simultaneously everywhere in space, and vice versa. The "future" is already "present." It is in existence "now." The notion of a future becoming present because time is flowing like water under a bridge is based upon an illusion that time is composed of successive "presents" flowing from the future into the present and from the present into the past—namely, that time exists only when it is made the present by this flowing

process, while what we think of as the future and the past are non-existent. This conception of the present is as if we were repeating to ourselves the word, "now, now, now . . ." There is nothing that can be called movement in this, any more than if we were standing still and repeating, "here, here, here . . ." in relation to space.

Time is omnipresent, and therefore omnixistent. And as the present in time exists simultaneously everywhere—that is to say, is common to all space—*time exists everywhere as the present. The present, or "now," therefore, includes the whole of the past and the whole of the future.* Hence the present in time is the simultaneous equivalent of the place in space where each one of us, and indeed every atom and every star, is *now*. The future, the equivalent of a locality we have not yet reached and the past of a locality we have left behind. Both localities exist independently of us—we having not yet reached the first and no longer being in the second—and they exist with the locality where we happen to be while travelling between both—that is to say, the present.

Consequently, what we call the future and the past exist simultaneously with what we call the present. Indeed, the future and the past actually are as living, as pulsating, as moving, and as changing as our "now," everything in time existing contemporaneously everywhere, as a mighty, omni-existent, unchangeable "present."

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We cannot escape such an everlasting present, which is present everywhere in space and time; and although we measure space in miles or inches, and time in years or seconds, we cannot get any distance whatever from the omni-existent *here* of space and *now* of time. Just as all objects are situated at separate points in space, so events exist in different epochs of time. These, however, are not in the past or the future; they are still in the omnipresent "present" of time and simultaneously in the omnipresent "here" of space.

Such omnipresent *now* of time and *here* of space are immovable. This because there is no portion of space where there is not time, and vice versa. Time which goes quickly or slowly, space which can be traversed swiftly or gradually, are illusions of our perception. In reality we are always in the *here* of space and in the *now* of time. This means that every object or person is everlastingly in an everlasting "present," no matter how slowly or how swiftly it might travel in space and time. If the speed or slowness of our moving cannot affect either time or space as such, it can, however, affect our perception in such a manner as to alter completely our evaluation of time and space.



That, owing to the limit of our units of time perception, which prevents us from seeing phenomena occurring beyond a certain slowness or a certain quickness.

Thus, were we to increase, say, one thousand times our unit of sight and sound perceptions, our life would contain a thousand more happenings than it does at present. Under such conditions we would have lengthened our existence to the equivalent of, let us say, 70,000 years under our present restricted time unit perception. In reverse, if our units of perception were decreased one thousand times we would be old before we saw the light of dawn for the twenty-fifth time since our birth. Were our unit of perception to be reduced a further one thousand times our whole life would be telescoped into the equivalent of forty-three minutes. Within such a span we would see the sun move only ten degrees; were we born, say, at 1 p.m. in July, we would see nothing but daylight, and none of our ancestors for fifteen generations would have seen the sun rise.

We could go further and produce an eternal present. That is to say, *stop time*, although bolting through space with the velocity of light. We could do more. We could slow down time or quicken its pace so as to get out of the present and enter the future. Thus, if we observed the propellers of a plane whose revolutions are one thousand per second, owing to our vision being limited to six revolutions per second it would be

impossible for us, say, to notice a stain on one of them. But were we to travel away from them at the speed of light, looking backwards, then the present would always accompany us. The propellers, although revolving at that colossal speed, would appear immobile, like anything else moving on earth. Everything would remain in such a motionless state for one minute or a billion years, provided we travelled with light for that time.

Should we slow down, say, one minute within one millennium, we would see the same spectacle enacted during one minute, but this would now take one thousand years to be accomplished, and our airplane would take five and three-quarter days and nights to fly one inch of space. Were we to increase our speed *beyond* the rate of light, then we would see events in the opposite direction. Houses would be demolished, plants would embed themselves in their seeds, the dead would resurrect, the future would give way to the past.

But, in these our travels backwards and forwards in space and time—that is to say, in what we call the past and the future—in reality we never escaped for a single billionth of a second from the *here* of space or the *now* of time. And this for the simple reason that the whole of space is composed of the *here*, and the whole of time is included in the *now*—the past and the future, no matter how remote, with all things in them, being existent in an eternal, immovable “present.”

(To be concluded next month)

Malthusianism and Rationalism

IT has been said—I think with justice—that anti-religionists disagree on almost everything except anti-religion. On no other subject, perhaps, is this so true as of Malthusianism. It has formed one of the bitterest bones of contention between Rationalists ever since Malthus formulated his famous theory 150 years ago.

One point should be clearly noted: birth control, as such, is not Malthusianism. What Malthus said was, that population tended to increase faster than the means of subsistence, and his *remedy* was, in the main, late marriage. He could not very well, as a Christian clergyman, advocate the use of contraceptives. But it was early recognized that late marriage could bring many other evils in its train, and Francis Place (the famous “Radical Tailor”), though a powerful advocate of Malthusianism, was one of the first, perhaps the first, who advocated artificial contraception in England and began the movement known as Neo-Malthusianism. His book, *Illustrations and Proofs of the Principle of*

Population, appeared in 1823, but there is little doubt that with the aid of handbills he was advocating birth control some time before.

He powerfully influenced Richard Carlile, who published his *Every Woman's Book* in 1826, after which appeared Robert Dale Owen's *Moral Physiology* (1831) and Dr. Charles Knowlton's *Fruits of Philosophy* (1832). Some pamphlets and handbills followed, but the next important work on both birth control and Malthusianism and, for that matter, on sexology was Dr. George Drysdale's *Elements of Social Science*. From Place to Drysdale it is interesting to note we have a succession of Freethinkers all stoutly advocating the Population Theory of Parson Malthus, and also artificial contraception.

The *Elements of Social Science* was a “godsend” both to Christians and to those Rationalists who had never emancipated themselves from the Christian conception of sex—that it is, in essence, something unclean. Those unfortunate Freethinkers who advised reading Drysdale's epoch

be obtained from other ascertained knowledge, yet a logically valid argument may be untrue because it is not derived from true premisses; or an illogical conclusion may be true if the invalid process of reasoning has somehow cancelled out the so-called facts it began with. But an invalid judgment from truth cannot be true—at least, invalidly inferred truths have no logical connection with the premisses they are supposed to be derived from. Therefore, to arrive at absolute truth two requirements must be fulfilled: we have to be unconditionally certain of our sensible and intuitive perceptions, and finally convinced of the pure validity of our inferences. If either is lack-

ing there can be no absolute knowledge, though if both are absent we *may* arrive at truth by inadvertently righting our initial errors in the course of the so-called reasoning.

To sum up, the prelude to all rational discovery is the realization—implicitly, at least—that the attainment of real knowledge is absolutely conditioned by the direct perception of undeniable realities on the one hand, and, on the other, the necessarily indisputable nature of the fundamental laws and forms of logical inference. Without such initial certainty we can never really begin to replace ignorance. But, thereafter, the ideal limit is omniscience. LEONARD TIPPEN.

Speculations on Time

(Concluded from February issue)

THE universe is permeated with waves, rills, and vibrations, known and unknown. In fact it is probable that it is made of them. Supposing that what we call life should be some kind of energy permeating space like electricity, magnetism, or gravitation, then surely its frequencies, like light, can travel in the everlasting "present" of space and time—i.e., in the past and future. If so, could it be that under favourable conditions its frequencies, by being in contact with images in space and therefore in time, can convey them to matter housing a form of consciousness—e.g., to man? Or that these and similar frequencies stored within ourselves can enable us literally to travel to the actual "heres" of space and "nows" of time—that is to say, in the past and in the future? Or, inversely, that such life frequency or other forms of energy, when solicited by will, consciousness, or emotions, might open a kind of telepathic window and permit us to see instantaneously events placed in the omni-existent present of space and time?

Man has not only experienced phenomena connected with the past, but, even more striking, with the future. Foreknowledge, mostly by dreams, cannot be disputed. If the future is not existent, how can we see events in it? Either it is a reality, or, if not, then such events cannot possibly be foretold. But future events have been, and continue to be, foretold, the possibility of the existence of the future thus having more foundation than the possibility of its non-existence.

* * *

This would prove even more—namely, not only the existence of the omni-present "present" throughout time and space, but also the existence of the universe as it is at this instant, as it was, and as it will be. In which case, either it is the

universe which created time or time which created the universe. If the past and the future are the everlasting "present," and if the everlasting "present" is space-time, then time is either indivisible from and synonymous with or is the producer of space and hence of matter, of energy, of motion—in fact, of the universe.

The universe is matter, but also energy. Energy and matter generate each other. When matter turns into energy, energy produces motion. Motion is impossible without space. If space becomes—and, in fact, is—time, then motion is a by-product of time. Time, therefore, even if by remote control, ultimately is the creator of the universe. Time and the universe are reciprocal by-products in the way that matter and energy are. Hence their indissolubility. As the originators of space, motion, energy, and matter, they are thus also the originators of time and the universe—that is to say, the originators of themselves. Namely, they are self-created.

* * *

But if time is synonymous with space, and space and time with the universe, then the universe either has existed while they existed, or, if not, there was a time when time and space were not existent.

Infinite space is inconceivable. Are, then, time and space and consequently the universe finite? If so, then time has a beginning, space is limited, and the universe ends somewhere. But is it not inconceivable to consider space as being limited? A timeless time is inconceivable. But what of a limited time? And yet one of these inconceivables must be true.

If the universe is finite, then outside its finiteness there is neither matter, motion, space, nor time. But then the timeless, matterless, spaceless,

motionless "outside," although not the finite universe, is in existence. In which case there are two simultaneous universes, one finite and the other infinite. The finite made of matter, energy, motion, space, and hence time; and the infinite, matterless, energyless, motionless, and hence timeless.

A finite universe, by its mere dynamism, would be expanding into the infinite. This would imply the creation of new motion, of new matter, of new space, and hence of new time, where they do not exist. Which would mean that time, by plunging simultaneously in all directions into the infinite, is extending not only the spacial boundaries of the finite cosmo but also the spacial boundaries of time itself. Could this explain the theories of the expanding universe?—namely, of a finite universe plunging into the absolute nothingness, timelessness, spacelessness, motionlessness, energylessness, matterlessness, of an infinite universe?

But then, if finite, this finite universe must have begun. From absolute nothingness? How can time become time from timelessness? Something must have existed in the infinite universe before time was time, to set in motion the finite universe. Empirical, inconclusive speculations? Yes! And yet, no more so than the solemn verdicts of those mutually hating Siamese twins: theology and science. For the truth is that both they and we know nothing.

As a fish on the sea-bed would speculate upon the universe in terms of water, so likewise man cannot avoid speculating upon it in terms of time as conceived by him. Matter, even when in the form of a human brain, is a by-product of time. As everything, within and outside us, is permeated with time, is generated by time, is cemented by time, and ultimately is dissolved by time, it follows that we are unable to understand the true nature, extension, and origin of time. As, to fully understand it, we would have to be outside time—namely, we would have to be non-existent.

Yet the mere fact that mankind, although in the immeasurable scheme of the cosmo with no more significance than a globule of bacteria, can bolt through time and space on the wings of its intellect is a portent no less astounding than that most astounding of all portents: Time, the originator and the devourer of all things.

AVRO MANHATTAN.

THE Czech League of Churchless and the Polish League of Freethinkers have met with similar fates. Both have become State societies "for the dissemination of scientific knowledge." The Czech body apparently retains its old title, but the Polish organization has been suppressed, and the new institution claims to have taken over its activities. *Verb. sap!*

HEATHIANA

I AGREE that we should not allow political differences to hinder our combined Rationalist activities. The main obstacle to progress, however, does not come from those with strong opinions but from those with no opinions at all. "Society," Josh Billings said, "iz made up of the good, bad and indifferent; and what makes so mutch trouble iz, the *indifferents* are in the majority."

I think it was Voltaire who suggested that if God did not exist it would be necessary to invent Him. The same seems (according to Prof. Arnold Toynbee) to be true of the Devil whose aid we need, he contends, if human nature is to be exercised and kept in training. I have a feeling that we should be better able to withstand the evils which beset us if we refrained from welcoming them.

The same Bishop Wilberforce who was in conflict with Huxley at the famous British Association Meeting in Oxford started an action in the Ecclesiastical Courts concerning belief in Hell. The Lord Chancellor, after appeal had been made to the Privy Council, announced the judgment that it was not heretical for Church of England Clergymen to deny the doctrine of Eternal Damnation.

Lord Justice Bowen's description of this event was "Hell dismissed with costs."

I can appreciate the kindly feelings of Roman Catholics who have ensured that the Virgin Mary should be comfortably translated to Heaven, in Body as well as in Soul, without tiresome delays; but it disturbs me to think that they withhold the same rights (and rites) from her husband.

To be interested in Sex is a sign of vitality, to be obsessed by it a symptom of impotence, to despise it a denial of common humanity.

There is a paragraph in Bertrand Russell's UNPOPULAR ESSAYS which I commend to those of our critics who talk about "old-fashioned rationalism." He says that although Aristotle and many others describe man as a Rational Animal, he has looked in vain (throughout a long life) for evidence in favour of this proposition.

On the contrary, he finds that cruelty, persecution and superstition are increasing by leaps and bounds "until we have almost reached the point where praise of rationality is held to mark a man as an old fogey regrettably surviving from a bygone age." Let our young fogeys, who think the battle is won, ponder over this statement.

Philosophers, like bores, repeat themselves: but somehow they manage to do it with distinction.

Gilbert Murray once remarked that the only remedy for bad thinking is to think better. Russell has said it again, but not less usefully. "It is not by old error that new error can be combated."